Navy Personnel Research and Development Center

San Diego, CA 92152-6800 TN 89-14 February 1989

NAVY PERSONNEL R&D CENTER
5 0557 01000323 2

NPRDC/TN 89-14

Development of a USMC Officer Assignment Decision Support System: Feasibility Study

Approved for public release; distribution is unlimited.

20001117 054

Reproduced From
Best Available Copy

AQU01-01-0010

c.3 REFERENCE

NPRDC TN 89-14

February 1989

Development of a USMC Officer Assignment Decision Support System: Feasibility Study

Robert E. Chatfield
Stephanie A. Gullett

Reviewed by
Robert F. Morrison, Ph.D.

Released by
John J. Pass, Ph.D.
Director, Personnel Systems Department

Approved for public release;
distribution is unlimited.

Navy Personnel Research and Development Center
San Diego, California 92152-6800

~~UNCLASSIFIED~~
~~SECURITY CLASSIFICATION OF THIS PAGE~~

REPORT DOCUMENTATION PAGE

1a REPORT SECURITY CLASSIFICATION UNCLASSIFIED	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3 DISTRIBUTION / AVAILABILITY OF REPORT Approved for public release; distribution is unlimited.
2b DECLASSIFICATION / DOWNGRADING SCHEDULE	
4 PERFORMING ORGANIZATION REPORT NUMBER(S) NPRDC TN 89- 14	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION Navy Personnel Research and Development Center 6b OFFICE SYMBOL (If applicable) Code 62	7a. NAME OF MONITORING ORGANIZATION
6c. ADDRESS (City, State, and ZIP Code) San Diego, California 92152-6800	7b. ADDRESS (City, State, and ZIP Code)
8a. NAME OF FUNDING / SPONSORING ORGANIZATION USMC Manpower Plans and Policy 8b. OFFICE SYMBOL (If applicable) MPI-40	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c ADDRESS (City, State, and ZIP Code) Washington, DC 22217-5000	10 SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO: 63732M; PROJECT NO: C0073; TASK NO: 02.03; WORK UNIT ACCESSION NO:

11 TITLE (Include Security Classification)

(U) Development of a USMC Officer Assignment Decision Support System: Feasibility Study

12 PERSONAL AUTHOR(S)
Robert E. Chatfield and Stephanie A. Gullet

13a. TYPE OF REPORT	13b TIME COVERED	14 DATE OF REPORT (Year, Month, Day)	15 PAGE COUNT
Technical Note	FROM 85 Sep TO 86 Feb	1989 February	34

16 SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Officer assignment, decision support system, automated information system
05	09		

19 ABSTRACT (Continue on reverse if necessary and identify by block number)

Four alternative approaches to development of an Officer Assignment Decision Support System (OADSS) to improve current methods of officer assignment in the United States Marine Corps were evaluated. This feasibility study examined both the operational and technical feasibility of the four alternatives and considered such factors as hardware, software, and communications. Both Existing System Enhancement and Distribution Processing--Minicomputer alternatives were deemed feasible but the former has a more favorable cost-benefits ratio, better in-house system support and will expedite system implementation. However, it is recommended that an Economic Analysis be conducted to further evaluate the two feasible alternatives.

20. DISTRIBUTION / AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS	21. ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED
22a. NAME OF RESPONSIBLE INDIVIDUAL Robert E. Chatfield	22b. TELEPHONE (Include Area Code) (619) 553-7660 22c. OFFICE SYMBOL Code 62

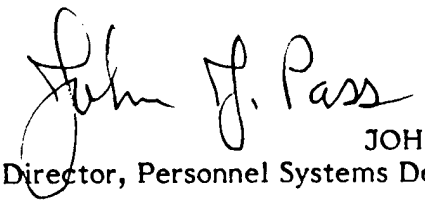
DD FORM 1473, 84 MAR 83 APR edition may be used until exhausted. All other editions are obsolete.

SECURITY CLASSIFICATION OF THIS PAGE
UNCLASSIFIED

FOREWORD

This report evaluates alternative approaches to development of an Officer Assignment Decision Support System (OADSS) to improve current methods of officer assignment in the United States Marine Corps (USMC). Among the deficiencies in the current assignment system are the labor-intensive review of hard copy-based information, need for a comprehensive and centralized data base, and lack of standardization among officer Monitors in their assignment strategies. Monitors critically need interactive, computer-based support for assignment decisions because of the volume of assignment-related information available and the vast number of assignment alternatives to be weighed. This feasibility study examines the operational and technical feasibility of four alternatives to system development and considers such factors as hardware, software, communications, etc. in the evaluation process.

This is the second in a series of reports that detail the "definition and design" phase of the USMC Life Cycle Management (LCM) process associated with OADSS. The research was conducted under work unit number M5402688WRRD8FY, Marine Corps Decision Support System for Officer Assignment. Future reports will include an economic analysis, project management plan, and system design specifications for OADSS development.



JOHN J. PASS
Director, Personnel Systems Department

SUMMARY

Background

Officer Monitors need support in their decision-making process due to the vast amount of assignment-related information to be considered and the number of assignment alternatives to be weighed. It is anticipated that a user-friendly, interactive Officer Assignment Decision Support System (OADSS) will help Monitors better implement United States Marine Corps (USMC) staffing policy, significantly reduce their clerical workload, and enhance the match of officers to billets.

Objectives

The objectives of this feasibility study were to provide an analysis of the broadly defined alternative approaches to meet user needs set forth in the earlier Needs Assessment; identify alternative approaches for system development that are both operationally and technically feasible; and to recommend one or more alternative approaches for further evaluation.

Alternatives for System Development

Four alternatives to system development were evaluated in terms of their potential for meeting technical, operational, and user requirements. Alternatives are discussed in broad conceptual terms without extensive consideration of system design and hardware/software issues.

Feasibility Determination

The four alternatives to system development were carefully evaluated for technical, operational, and economic feasibility. General technical feasibility criteria applicable to all Marine Corps automated information systems were included as well. A feasibility analysis was conducted by scoring each alternative on a 10-point rating scale on each technical and operational requirement. Total scores for the two feasible alternatives exceeded the 100 point cutoff while the other two alternatives did not.

Life Cycle Analysis

The two alternatives identified as being both technically and operationally feasible were further evaluated in a life cycle analysis to make an initial assessment of "affordability." The analysis used high-level cost information and did not include sunk costs, complete hardware/software maintenance and the like. Projected recurring costs were presented for a 5 year period.

Benefits Analysis

To supplement the evaluation of economic feasibility, a benefits analysis was conducted to assess potential benefits associated with each of the two feasible alternatives. Potential benefits discussed included improved "customer service" to constituent officers, enhanced morale of Monitors, timely access to assignment-related data, flexibility of applications, and expandability of the system.

CONTENTS

Page

INTRODUCTION 1

Background 1
Objectives 2
Alternative Approaches 2
Problems and User Requirements 3
Information Sources 4

ALTERNATIVES FOR SYSTEM DEVELOPMENT 5

Alternative 1: Existing System 5
Concept 5
Software 6
Equipment 7
Alternative 2: Existing System Enhancement 7
Concept 7
Software 7
Equipment 9
Alternative 3: Distributed Processing--Minicomputer 10
Concept 10
Software 10
Equipment 11
Alternative 4: Distributed Processing--Microcomputer 12
Concept 12
Software 13
Equipment 14
Problems With This Alternative 14

FEASIBILITY DETERMINATION 15

Defining Feasibility 15
Aspects of Feasibility 16
Economic Feasibility 16
General Technical Feasibility Criteria 16
General Operational Feasibility Criteria 16
Feasibility Analysis of Alternative Approaches 17
Summary 17

LIFE CYCLE ANALYSIS 18

Cost Estimating 18

BENEFITS ANALYSIS 20

Existing System Enhancement 21
Distributed System--Microcomputer 21

SELECTION PROCESS 22

INTRODUCTION

Background

The mission of the Manpower Management Officer Assignment Branch (MMOA), located at Headquarters, USMC (HQMC) is to administer assignment of all Marine Corps officers (Colonel and below) in accordance with regulations, approved assignment policies, and criteria of the Commandant of the Marine Corps (CMC). Functions carried out in support of this mission include: issuing travel orders; classifying/reclassifying officers in occupational specialties; and assigning officers to educational, intermediate, and top level schools. The individuals within MMOA who make assignment decisions (subject to approval by higher authority) are referred to as officer "Monitors." Monitors have a very difficult job in that they are expected to accommodate both the manning requirements of the Marine Corps and the career/personal needs of officers via the assignment process. Performing this task requires concurrent consideration of the job dimensions of available billets and the skills and attributes of officers being assigned.

Monitors' first consideration in staffing is the "fill" of available billets while the next is the "fit" of officers to specific billets based upon their education, work experience, military occupational specialty (MOS), etc. The process of reaching an assignment decision may involve accessing on-line personnel data bases such as the Joint Uniform Military Pay System/Manpower Management System (JUMPS/MMS), reviewing Officer Fitness Reports (FITREPS) on microfiche, talking with constituents in person or on the telephone, or reviewing a number of other relevant sources of information. In conjunction with this, Monitors must also be mindful of established staffing policy, USMC manning levels, and career development needs of individual officers when weighing assignment alternatives.

The idea for establishing an Officer Assignment Decision Support System (OADSS) came about because it was evident that Monitors need support in their decision-making process due to the vast amount of assignment-related information to be considered and the number of assignment alternatives to be weighed. It is anticipated that a truly user-friendly, interactive Decision Support System (DSS) will help Monitors better implement USMC staffing policy, significantly reduce the clerical workload of Monitors, and enhance the match of officers to billets.

The original effort to develop a DSS for Monitors was carried out by a contractor as part of the Officer Precise Personnel Assignment System (Officer PRE-PAS) in 1979. However, this work stressed an optimization approach to officer assignment and was terminated in the early, concept development stage of the Life Cycle Management (LCM) process. A subsequent contractor effort to build OADSS, in 1981, was also terminated in the concept development stage as it also relied too heavily upon optimization techniques and was not sufficiently interactive. Both of these attempts were doomed to failure as the Marine Corps objected to any "black box" (i.e., optimization) approach perceived to automate the assignment process. The goal was to support Monitors in their decision-making, not to make assignment decisions for them.

The idea for developing the OADSS lay dormant until 1985 when support for a third attempt at system development became available at the Navy Personnel Research and Development Center (NAVPERSRANDCEN). The project sponsor, Manpower Plans and Policy (MPI), specified that system design be carried out by Personnel Research Psychologists rather than Operations Researchers or Computer Specialists under the assumption that this would avoid yet another optimization-oriented approach to system

Problems and User Requirements

The Needs Assessment conducted earlier identified several deficiencies in the current officer assignment process. Deficiencies are briefly summarized below with the reader referred to the Needs Assessment or the LCM Requirements Statement for more information.

1. Lack of standardization among officer Monitors in assignment procedures and decision-making practices.

2. Data elements are not accessible in a simple, consistent manner using current automated procedures.

3. Available computer data bases do not contain all of the data elements needed for review in assignment decision-making.

4. Several data elements (e.g., education and experience codes) are misleading and not reflective of actual skills and qualifications.

5. Review of data elements is characterized by manual, labor-intensive procedures that are extremely time-consuming and burdensome.

6. Existing methods of searching, sorting, and displaying data (ad hoc analysis and data retrieval) are not adequately user-friendly.

7. Current computer resources are not effectively used by the majority of Monitors; due to a variety of factors.

8. Existing computer hardware is overworked and response time decrement during periods of peek usage is unacceptable for productive on-line data query/review.

9. Extensive redundancy and duplication of effort exists in data base update procedures.

10. Data element reliability is frequently questionable and entries must often be verified/corrected by Monitors.

11. Materials carried by Monitors for on-site constituent visits are cumbersome and data collection/update procedures are time-consuming due to manual procedures used.

12. Update/modification of the Officer Staffing Goal Model (OSGM) dictionary is fragmented and excessively time-consuming.

13. Monitors' input to the OSGM dictionary is often not well considered and reviewed, producing output of questionable validity.

14. Training for Monitors is inadequate as materials are not specifically tailored for their responsibilities and formal training sessions are not well structured.

The broad-based emphasis of OADSS will yield substantial improvement in three principle areas: (1) development of improved training materials and expanded formalized training; (2) streamlined and simplified OSGM dictionary update procedures; and (3) timely access to an expanded scope of data elements via improved, user-friendly ad hoc query and data

proposal for development of an officer assignment system based on optimization strategies.

3. "Automated Data Systems (ADS) Documentation," Department of Defense Standard 7935, 15 February 1983. This document provides the Department of Defense (DoD) guidelines for the development and revision of documentation for ADSs and describes technical documents to be produced throughout the life cycle of an ADS.

ALTERNATIVES FOR SYSTEM DEVELOPMENT

Four alternatives for system development were evaluated, in terms of their potential for meeting technical, operational, and user requirements. The alternatives are discussed below in broad conceptual terms without extensive consideration of system design and hardware/software issues.

Alternative 1: Existing System

The first alternative evaluated for system development is continued use of the mainframe computer at the Marine Corps Central Design and Programming Activity (MCCDPA), Quantico.

Concept

ADP Support for Monitors is provided solely by the Amdahl 470 V/8 mainframe located at the MCCDPA, Quantico. Monitors access the mainframe using video display terminals (VDTs) located throughout MMOA with communications supplied via leased communication lines. Microcomputers are used by MMOA-3 (Systems) and a few officer Monitors. Monitors may make use of the mainframe in maintaining the office slate file (OSF), reviewing the availability/eligibility of officers, generating simple reports, etc. However,the only function that all Monitors use the computer for is maintenance of the OSF using an interactive program. While several information sources are available for computer access (Headquarters Master File (HMF), MMS, OSF), many others exist only in hard copy (Slate Letters) or microfiche (FITREP) form. Manual review of these non-computer-resident information sources is extremely labor-intensive and time-consuming. The present ADP environment has several shortcomings,the major one being severe response time decrement during periods of heavy usage (which coincides with the Monitors' normal workday). In frustration over slow, nonproductive use of the computer, many Monitors have grown dependent on manual review of data elements. A contributing factor to this problem of "computer avoidance" is the difficulty of gaining proficiency in the Data Base Management System (DBMS), ADABAS NATURAL. NATURAL is not particularly user-friendly for ad hoc query and data retrieval so most Monitors delegate ADABAS queries to their assistants or make no use of the DBMS at all. In sum, the existing system is plagued by an often unresponsive computer, a non-user-friendly DBMS, and other problems that have resulted in Monitors relying on slow, labor-intensive activities when weighing assignment alternatives. Refer to Figure 1 for a high level overview of the existing system.

Equipment

Computer processing is currently centralized on an AMDAHL 470 V/8 mainframe located at MCCDPA, Quantico. Four IBM microcomputers are resident in MMOA that are used principally by MMOA-3 (Systems) personnel. The OSGM is run on a CYBER 170 mainframe located at CDC's Eastern Cybernet Center (ECC) in Rockville, Maryland. The CYBER is used only by MMOA-3 (Systems) personnel who are responsible for submitting OSGM control card files and running the model.

Alternative 2: Existing System Enhancement

The second alternative evaluated for system development is to upgrade existing centralized, mainframe computer processing with hardware/software enhancements.

Concept

Centralized ADP support is provided to the Officer Assignment Branch (MMOA) by an AMDAHL 470 V/8 mainframe computer located at the Marine Corps Central Design and Programming Activity (MCCDPA), Quantico, Virginia. However, due to deficiencies identified in the Needs Assessment, several enhancements are required to provide the desired level of support for MMOA. First, the size of the Central Processing Unit (CPU) will be greatly increased in order to provide rapid, on-line response to Monitors' data base queries. Disk storage will be increased as well so that present constraints on file size and file creation are eliminated. In terms of software, a DBMS will be selected that is exceptionally easy to use as well as powerful and versatile. Communication between HQMC and the MCCDPA will continue to be conducted via high speed, leased communication lines. HQMC users will continue to access the mainframe using VDTs located throughout their office spaces. Data bases accessed by Monitors will continue to reside on the mainframe and system access will be available in both on-line and batch modes. Monitors will typically operate in an on-line status with batch processing reserved for tasks requiring a large amount of CPU time. Overall, data input/output, processing steps, and Monitors' system access procedures will be largely unaffected by this alternative. Generation of voluminous, hard copy reports will continue to be accomplished via formal request to manpower analysts at the MCCDPA. Several miscellaneous (e.g., Special Education Program (SEP) and Aviation Career Incentive Pay (ACIP) data bases) ADP support functions will continue to be conducted by MMOA-3 (Systems) using microcomputers. An AMDAHL communications link will be established with the Computer Data Corporation (CDC) CYBER machine so that OSGM control files are more efficiently updated. Refer to Figure 2 for a high level overview of this alternative.

Software

General requirements for OADSS software are as follows:

1. Interactive data entry facilities to all users to perform file maintenance, conduct data query and retrieval, and generate reports.

2. Comprehensive statistical analysis capabilities, to include a wide range of descriptive and inferential statistics.

3. Applications generator or similar artificial intelligence-based method of conducting on-line, interactive ad hoc query and data retrieval.

It is expected that that the DBMS software selected for system development will satisfy several of the requirements stated above. The major criterion in selection of a DBMS will be the quality of its user interface. Specifically, the DBMS must be menu-driven, have window/screen processing features, and include an applications generator (or equivalent). It should be noted that FOCUS, recently installed at the MCCDPA, offers excellent potential for meeting these requirements. File maintenance of the OSF will continue to be accomplished with an interactive program created by MPI-40. The SAS software package or DBMS Statistical functions will be used for performing supplemental statistical analyses.

MMOA microcomputers will continue to run R:base 5000, Lotus 1-2-3, and a variety of other commercial software currently utilized for special purpose applications. At the microcomputer level, use of PC/FOCUS will be investigated because of its versatility and "Table Talk" applications generator.

Equipment

Equipment required to implement this alternative is discussed below:

1. Mainframe Processing--As discussed earlier, the primary emphasis of this alternative involves enhancing the existing AMDAHL 470 V/8 environment. However, it is virtually impossible to specify precisely how extensive this upgrade effort must be to provide consistently acceptable response time. Although the CPU was recently upgraded from 16 megabytes to 64 megabytes, the system still slows significantly during periods of peek usage. The MCCDPA is cognizant of the frequent unacceptable system response time and plans to continue to procure equipmnent to improve the situation. For example, the master plan calls for an increase from the current 12 MIPS (millions of instructions per second) to 120 MIPS by 1989. These types of major enhancements are, however, susceptible to budget cuts and cannot be construed as a guaranteed. If selected, the success of this alternative is completely dependent upon how expediently the MCCDPA can procure and install hardware upgrades.

2. Microcomputer Processing--Limited microcomputer processing will continue to be conducted on four IBM XTs located in MMOA. However, there is a need for at least two additional microcomputers to be purchased. The microcomputers should have, as a minimum, the following characteristics:

a. 640 KB Random Access Memory (RAM).
b. 20 MB internal hard disk drive.
c. 360 double-sided floppy diskette drive.
d. Monochrome VDT.
e. Graphics capability.
f. Bisynchronous communications adaptor.
g. 3270 Emulation Board.

3. Communications--Communications between HQMC and the MCCDPA, Quantico, will continue to be provided by high speed, leased communications lines. Communications will also be established between the MCCDPA, Quantico, and CDC to support OSGM control file maintenance.

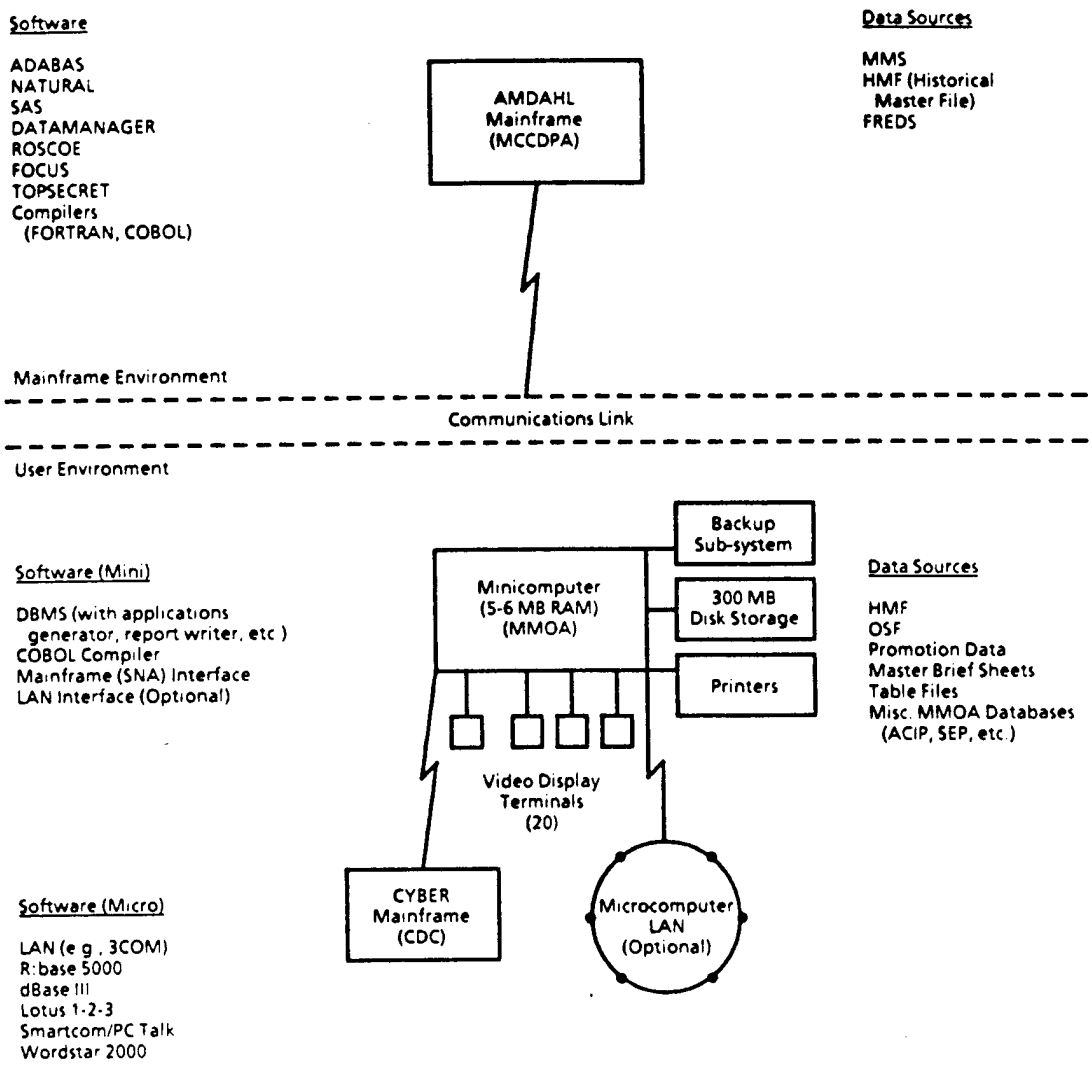


Figure 3. Alternative 3: Distributed processing--minicomputer.

Equipment

Equipment required to implement this alternative is discussed below:

1. Minicomputer Processing--The key feature of this alternative is installation of a minicomputer at HQMC for dedicated MMOA processing. It should be noted, however, that the line between "minicomputer" and "super microcomputer" is often a difficult one to draw. For the purposes of consistency and simplicity, the term minicomputer will be used exclusively even though such machines are often referred to by their manufacturers as super microcomputers. The significant benfit to be produced by installation of this machine is rapid response to Monitors' on-line queries and data retrieval requests. Based on an analysis of MMOA information flow and a review of present assignment procedures, tentative minicomputer specifications have been derived. The machine will have a minimum of 5-6 megabytes of high speed RAM to provide excellent response time and will

Each Monitor will be trained to boot the machine, issue a variety of operating system commands, use the DBMS, etc. Communication with a mainframe will be continued because data download/upload will be frequent and tasks requiring a great deal of processing time or mainframe-specific software will be run on the AMDAHL. That is, machines will perform jobs for which they are best suited so that resource utilization is optimized. Refer to Figure 4 for a high level system overview of this alternative. It should be noted that this figure represents only one of the many ways in which a LAN may be configured.

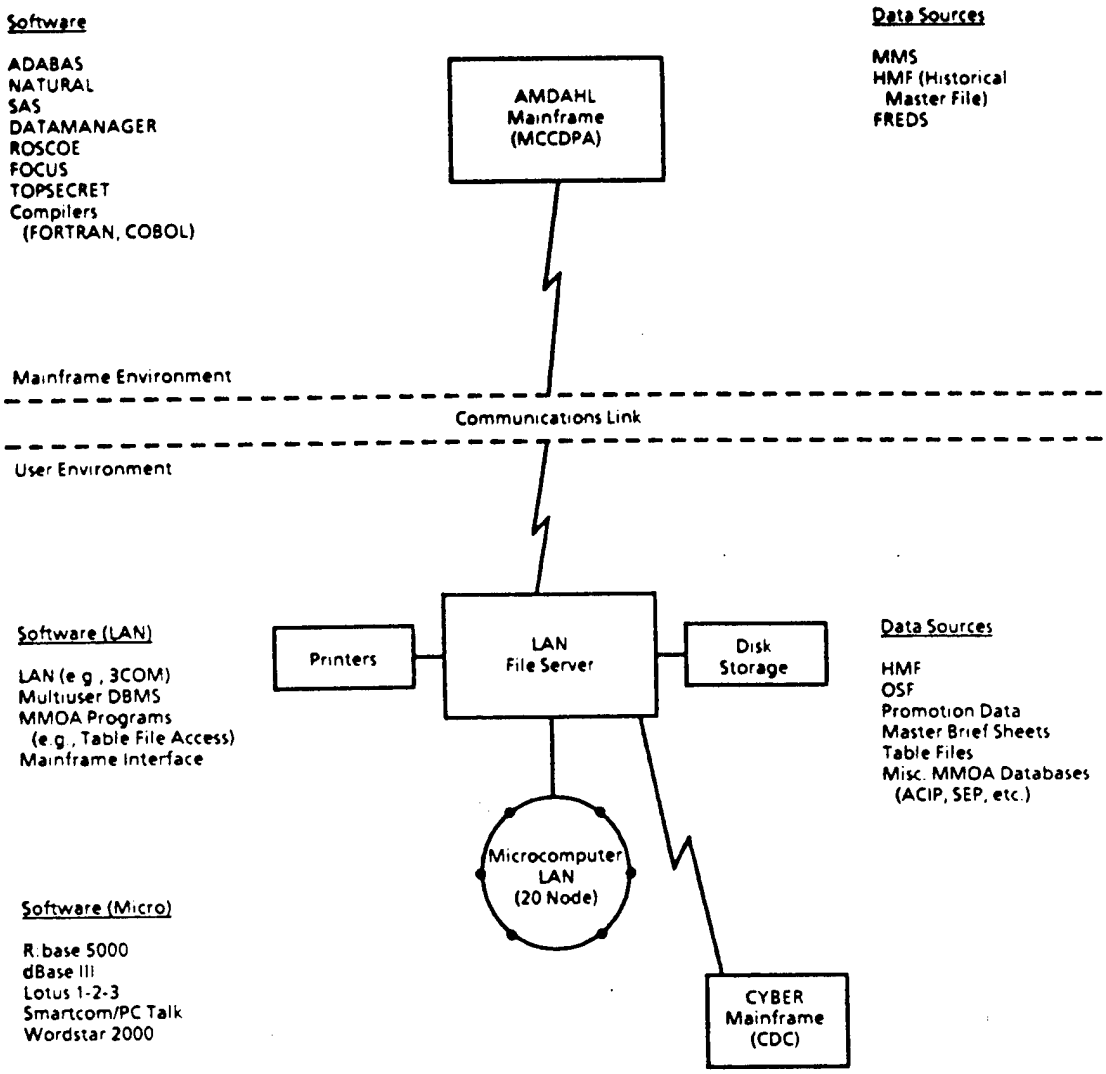


Figure 4. Alternative 4: Distributed processing--microcomputer.

Software

In order to effectively implement distributed processing using microcomputers, a LAN must be established. The software associated with the network will provide a multi-

a cost approximately $4000 per machine, must be purchased the alternative is not economical. In addition, the cost per "workstation" to establish a LAN typically falls in the $500-$700 range. Based upon such economic considerations, many organizations have found that it is more cost-efficient to buy a more powerful and versatile multi-user super-microcomputer system.

2. Software for the multi-user microcomputer environment is somewhat limited. Although several companies have recently released multi-user versions of their software (e.g., PC/FOCUS), this software cannot be classified as state-of-the-practice.

3. LAN vendors generally overestimate the number of nodes that can operate on the network. Based upon the experience of MCCDPA, Quantico, personnel at a 32-node network can effectively support only 8 users. Few, if any, state-of-the-practice LANS for 20 users currently exist.

4. Heavy transaction processing with data entry and retrieval from common data bases is not suited for a network environment because file servers often cannot handle the demand.

5. Data security is often problematic in a distributed, multi-user environment, making the system manager's job extremely demanding.

6. Installation is often a complex task requiring extensive on-site participation by the vendor. Also, wiring costs can exceed the cost of the LAN software and file server.

7. This alternative places several new demands on Monitors and runs counter to the OADSS emphasis on a simple, "turnkey" system. That is, Monitors will be required to learn to boot their machines, manage hard disk storage, issue operating system commands, interface with the LAN, etc.

FEASIBILITY DETERMINATION

Defining Feasibility

The term "feasible" means capable of being realized; however, "possible" and "practicable" can also mean capable of being realized. Feasible is distinguished from the other two terms as follows:

- Possible implies that user requirements may certainly be satisfied, given the proper circumstances.

- Practicable implies that user requirements may easily or readily be satisfied by available means or under certain conditions.

- Feasible suggests what is likely to be successful in satisfying user requirements.

Although the determination of feasibility is clearly judgmental, the procedure is based on careful analysis and the process of elimination. Alternatives are individually analyzed with a view toward finding any characteristic or quality that would render them infeasible. If such a characteristic or quality is found, the feasibility analysis of that approach may be terminated. However, the rationale for adjudging the alternative

4. Feasible alternatives should operate within the normal office environment and not require additional manpower to operate and manage.

Feasibility Analysis of Alternative Approaches

This section describes how alternatives were evaluated for both technical and operational feasibility. Feasibility issues discussed are a combination of user requirements identified in the Needs Assessment, general technical feasibility criteria, and general operational feasibility criteria. The method used to evaluate alternative approaches is described below:

1. Criteria for feasibility were identified (based primarily on user requirements and environmental constraints) and classified as either a technical or operational requirement.

2. A 10-point rating scale, ranging from 1 (poor) to 10 (excellent) was used to score each alternative on how well it met each requirement.

3. Total scores on technical and operational sections were derived by summing across all requirement ratings for each section. An overall score was derived for each alternative by adding the technical and operational section totals.

4. Alternatives with an overall score of less than 100 were classified as "infeasible" and were not further evaluated.

Figure 5 summarizes the result of this evaluative procedure and associated scores for each alternative. Distributed Processing--Minicomputer received the highest point total and Existing System the lowest.

Summary

Referring to Figure 5, two of the alternative approaches are categorized as feasible: (1) Existing System Enhancement and (2) Distributed Processing--Microcomputer. The other two alternatives are infeasible because their point totals in the feasibility analysis fell below the 100-point cutoff. The Existing System alternative is infeasible because: system response time is too slow and the system is not user-friendly for ad hoc queries and data retrieval. The Distributed Processing--Microcomputer alternative is infeasible because: the LAN will be difficult to install, availability of multi-user software is limited, and the system will not be easy to use because Monitors will have to boot their machines, issue operating system commands, etc. In addition, the cost of installing a 20 node microcomputer-based LAN will be very expensive due to a lack of stand-alone machines currently available in MMOA.

software; (3) installation of additional communication lines. As noted in Figure 6, it is impossible to accurately estimate costs associated with upgrading the existing system's hardware. Such major enhancements are coordinated by the MCCDPA, Quantico, and HQMC (C4) as part of the master plan for ADP expenditures. The estimate provided in Figure 6 is limited to procurement of two microcomputer systems and some peripherals. Recurring costs include: (1) microcomputer and peripheral device maintenance; (2) software upgrades and maintenance; and (3) leased line communication charges.

Nonrecurring Costs

	Year				
Cost Element	1	2	3	4	5
A. Hardware[1]	22,000				
B. Software	43,000				
C. Communications	8,000				
Total	73,000	0	0	0	0

Recurring Costs[2]

	Year				
Cost Element	1	2	3	4	5
A. Hardware	2,400	2,640	2,904	3,194	3,514
B. Software	5,500	6,050	6,655	7,320	8,053
C. Communications	4,000	4,400	4,840	5,324	5,856
Total	11,900	13,090	14,399	15,838	17,423

[1]Accurate estimates cannot be made because mainframe enhancements are coordinated by MCCDPA, Quantico, and HQMC. Estimates provided include only purchase of four microcomputers and peripheral devices. The cost for hardware upgrades needed to meet user requirements is prohibitively high in terms of accomplishing with OADSS funding.

[2]10% annual inflation factor used in estimating recurring costs.

Figure 6. Estimated costs for existing system enhancement.

Estimated costs for Distributed Processing--Minicomputer are presented in Figure 7. As the addition of a microcomputer-based LAN is optional, those costs are not included. Nonrecurring costs include: (1) purchase of a complete minicomputer system; (2) purchase of a user-friendly DBMS, COBOL compiler, and special programming for the AMDAHL/minicomputer interface; and (3) installation of additional communication lines. In contrast to the other feasible alternative, accurate hardware estimates are possible. Recurring costs include: (1) minicomputer system maintenance; (2) software upgrades and maintenance; and (3) leased line communication charges.

Existing System Enhancement

A discussion of the Existing System Enhancement alternative as it is anticipated to provide benefits described above follows:

1. Improved "customer service" to constituent officers. This benefit will be provided by this alternative to the extent that the system's response time will be significantly improved and a powerful, easy to use DBMS is available to Monitors. That is, Monitors need to make fast, on-line data base queries in response to constituents' questions/input regarding available billets, duty preferences, and other assignment-related factors. In addition, an expanded scope of data elements for Monitors to access will promote better person-job matches.

2. Enhanced morale of officer Monitors. This benefit will be provided by the alternative to the extent that training materials are improved, the system is easy to use, and labor intensive practices are eliminated. In particular, reduction of manual review of data elements will improve morale by reducing monotony and Monitors' clerical workload. In addition, Monitors will genuinely gain satisfaction from better serving constituents.

3. Timely access to data elements. This benefit will be provided by the alternative because system response time for ad hoc query and data retrieval will be improved. Monitors will be able to access information as needed rather than delegating data base queries to their assistants.

4. Flexibility of applications. This benefit will be only partially provided by the alternative. That is, ADP applications such as the maintenance of MMOA data bases (e.g., ACIP, SEP) will likely continue to be performed on microcomputer. Application flexibility will be constrained by resource restrictions of the MCCDPA, Quantico.

5. Expandability and growth potential. This benefit will not be substantially provided by the alternative. Expandability and growth of the system will continue to be dependent upon the MCCDPA, Quantico. However, if enhancements introduced are major, the likelihood of improved processing speed for MMOA will be great.

Distributed System--Microcomputer

A discussion of the Distributed System--Microcomputer alternative as it is anticipated to provide benefits described above follows:

1. Improved "customer service" to constituent officers. This benefit will be fully achieved by the alternative because the MMOA-dedicated minicomputer will allow Monitors to provide immediate feedback to constituents' questions. Monitors will use the DBMS to update files, match constituent qualifications to billet requirements, etc. In addition, it will be quite easy to download data to a portable PC for Monitors to take with them on on-site visits.

2. Enhanced morale of Officer Monitors. This benefit will be provided by the alternative as the minicomputer will substantially improve system response time, system access will be simplified, and user-friendly software will be introduced. Much of the Monitors' frustration and "computer avoidance" stems from an unresponsive computer system and a lack of adequate training. Monitors will be freed from the drudgery of slow, manual processing of data elements and have more time available to interact with constituents.

RECOMMENDATIONS

Based on the present feasibility study for development of the OADSS, the following recommendations are made.

1. As the next stage in the Definition and Design Phase of the LCM process, an Economic Analysis should be completed. The Economic Analysis will present detailed cost estimates associated with the two feasible alternatives identified in this report and ensure that the final alternative selected is cost-effective. However, at this point in the LCM process, Existing System Enhancement is the recommended alternative.

2. Because of the diversity of deficiencies identified in the present system, consideration should be given to developing the system as a series of subsystem prototypes. This "rapid prototyping" approach is consistent with modular system design and would minimize the time it takes to deliver a working product to users.

3. The hardware/software selected for system implementation should be readily integrated with existing Marine Corps automated information systems. Ideally, the system will be able to access mainframe data bases already resident at the MCCDPA, Quantico.

APPENDIX

TERMS AND ABBREVIATIONS

TERMS AND ABBREVIATIONS

ACIP	Aviation Career Incentive Pay
ADP	Automated Data Processing
ADPE	Automated Data Processing Equipment
ADS	Automated Data System
AIS	Automated Information System
ASL	Annual Slate Letter
ASR	Authorized Strength Report
CDC	Computer Data Corporation
CMC	Commandant of the Marine Corps
CPU	Central Processing Unit
CSR	Command Staffing Report
DBMS	Data Base Management System
DoD	Department of Defense
DSS	Decision Support System
ECC	Eastern Cybernet Center
FITREPS	Officer Fitness Reports
FS	Feasibility Study
HMF	Headquarters Master File
HQMC	Headquarters, United States Marine Corps
JUMPS/MMS	Joint Uniform Military Pay System/Manpower Management System
LAN	Local Area Network
LCM	Life Cycle Management
LCM-AIS	Life Cycle Management Plan for Automatic Information System
MBS	Master Brief Sheet
MCC	Monitored Command Code
MCCDPA	Marine Corps Central Design and Programming Activity
MID	Military Identification Number
MIPS	Millions of Instructions Per Second
MM	Personnel Management Division
MMEA	Manpower and Personnel Enlisted Assignment Branch
MMOA	Manpower Management Officer Assignment Branch
MMOS	Manpower Management Operations and Support Branch
Monitor	An officer in the Manpower Management Officer Assignment Branch responsible for effecting assignment of USMC officers
MOS	Military Occupational Specialty
MPI	Manpower Plans and Policy
NAVPERSRANDCEN	Navy Personnel Research and Development Center
OADSS	Officer Assignment Decision Support System
OSF	Officer Slate File
OSGM	Officer Staffing Goal Model

DISTRIBUTION LIST

Distribution:
Commandant of the Marine Corps (MPI-40), (MMOA)

Copy to:
Commandant of the Marine Corps (MPI-220)